



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,900	03/31/2004	Tsung-Kuan Allen Chou	P-6477-US	5011
49444	7590	04/27/2006	EXAMINER ROJAS, BERNARD	
PEARL COHEN ZEDEK LATZER, LLP 1500 BROADWAY, 12TH FLOOR NEW YORK, NY 10036			ART UNIT 2832	PAPER NUMBER

DATE MAILED: 04/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/812,900

Applicant(s)

CHOU ET AL.

Examiner

Bernard Rojas

Art Unit

2832

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 2, 12 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-11, 13-21 and 23-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

The indicated allowability of claims 8-10 is withdrawn in view of a new interpretation of the prior art of record, Dickens et al. [US 6,657,525]. Rejections based on the newly cited reference(s) follow.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the method for determining the desired location of the top electrode is determined based on an opening time period of said switch must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10, 16 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the desired location of the contact electrode on the top electrode is determined based on an opening time period of the switch.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 2, 6, 8, 9, 11 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by DeReus [US 6,876,482].

Claim 8, DeReus discloses a device comprising: a contact switch [figures 1 and 2] comprising: a bottom electrode structure including a bottom actuation electrode [106]; and a top electrode structure including a top actuation electrode [114] and one or more stoppers [118] able to maintain a predetermined gap between said top electrode and said bottom electrode when said switch is in a collapsed state [figure 2], wherein said first electrical contact [120] is positioned on a contact beam [112] associated with said top electrode [figure 2], wherein a spring constant of said contact beam is bigger than a spring constant of a support beam [122] associated with said top electrode [figure 2, when in the closed state the contact beam does not deflect while the support beam is deflected].

Claim 6, DeReus discloses the device of claim 98 wherein at least one of said stoppers is able to contact said bottom electrode when said switch is in said collapsed state [col. 9 lines 50 to 65].

Claim 7, DeReus discloses the device of claim 8, wherein said bottom electrode structure comprises one or more electrically isolated islands [the electrode is an electrically isolated island since it is isolated by the isolative substrate 102, col. 7 line 61 to col. 8 line 5], and wherein at least one of said stoppers is able to contact at least one of said islands when said switch is in said collapsed position [col. 9 lines 50 to 65].

Claim 9, DeReus discloses a device comprising: a contact switch [figure 1] comprising: a bottom electrode structure including a bottom actuation electrode [106];

and a top electrode structure including a top actuation electrode [114] and one or more stoppers [118] able to maintain a predetermined gap between said top electrode and said bottom electrode when said switch is in a collapsed state [col. 9 lines 50 to 65]; and a first electrical contact [120] able to be electrically connected with a second electrical contact [104] when said switch is in a closed state, wherein said first electrical contact is positioned at a desired location on said top electrode [figure 2, the electrical contact is positioned on the top electrode above the second electrical contact].

Claim 2, DeReus discloses the device of claim 9, wherein at least one of said stoppers is able to contact said bottom electrode when said switch is in said collapsed state [col. 9 lines 50 to 65].

Claim 11, DeReus discloses a system comprising: a switching arrangement including at least one contact switch comprising: a bottom electrode structure including a bottom actuation electrode [106]; and a top electrode structure including a top actuation electrode [114] and one or more stoppers [118] able to maintain a predetermined gap between said top electrode and said bottom electrode when said switch is in a collapsed state [col. 9 lines 50 to 65]; and wherein said first electrical contact is positioned at a desired location on said top electrode [figure 2, the electrical contact is positioned on the top electrode above the second electrical contact]; and a switch controller able to control operation of said at least one contact switch [DeReus inherently requires a controller in order to operate the Mem switch by providing the opening/closing signals to the actuation electrodes]

Claim 12, DeReus discloses the device of claim 9, wherein at least one of said stoppers is able to contact said bottom electrode when said switch is in said collapsed state [col. 9 lines 50 to 65].

Claims 1, 3-7, 11 and 13-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Dickens et al. [US 6,657,525].

Claim 8, Dickens et al. discloses a device comprising: a contact switch [figures 2A-2C] comprising: a bottom electrode structure including a bottom actuation electrode [70, 71]; and a top electrode structure including a top actuation electrode [60, 61] and one or more stoppers [54, 55] able to maintain a predetermined gap between said top electrode and said bottom electrode when said switch is in a collapsed state [figure 2C], wherein said first electrical contact is positioned on a contact beam [48] associated with said top electrode [figure 2A], wherein a spring constant of said contact beam is bigger than a spring constant of a support beam associated with said top electrode [figure 2C, when in the closed state the rigid central stiffener portion contact beam 48, does not deflect while the support beam is deflected].

Claim 9, Dickens et al. discloses a device comprising: a contact switch [figures 2A-2C] comprising: a bottom electrode structure including a bottom actuation electrode [70, 71]; and a top electrode structure including a top actuation electrode [60, 61] and one or more stoppers [54, 55] able to maintain a predetermined gap between said top electrode and said bottom electrode when said switch is in a collapsed state [figure 2C]; and a first electrical contact [64] able to be electrically connected with a second electrical contact [42, 43] when said switch is in a closed state, wherein said first

electrical contact is positioned at a desired location on said top electrode [figure 2B, the electrical contact is positioned on the top electrode above the second electrical contact].

Claim 3, Dickens et al. discloses the device of claim 9, wherein said bottom electrode structure comprises one or more electrically isolated islands [74, 75], wherein at least one of said stoppers is able to contact at least one of said islands when said switch is in said collapsed state [figure 2C].

Claim 4, Dickens et al. discloses the device of claim 9 comprising a support beam [48] associated with said top electrode and having a generally low spring constant.

Claim 5, Dickens et al. discloses the device of claim 9, wherein said top electrode is generally rigid [due to rigid support piece 48].

Claim 11, Dickens et al. discloses a system comprising: a switching arrangement including at least one contact switch comprising: a bottom electrode structure including a bottom actuation electrode [70, 71]; and a top electrode structure including a top actuation electrode [60, 61] and one or more stoppers [54, 55] able to maintain a predetermined gap between said top electrode and said bottom electrode when said switch is in a collapsed state; and wherein said first electrical contact is positioned at a desired location on said top electrode [figure 2B, the electrical contact is positioned on the top electrode above the second electrical contact]; and a switch controller able to control operation of said at least one contact switch [Dickens et al. inherently requires a controller in order to operate the Mem switch by providing the opening/closing signals to the actuation electrodes]

Claim 13, Dickens et al. discloses the system of claim 11, wherein said bottom electrode structure comprises one or more electrically isolated islands [74, 75], wherein at least one of said stoppers is able to contact at least one of said islands when said switch is in said collapsed state [figure 2C].

Claim 14, Dickens et al. discloses the system of claim 11, wherein said switch comprises a support beam [48] associated with said top electrode and having a generally low spring constant

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 15, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickens et al. [US 6,657,525].

Claim 15, Dickens et al. discloses the claimed invention except for the claimed actuation voltage and contact force between the first and second contacts. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the actuation voltage and contact force between the first and second electrical contacts in order to increase the speed of the switch and the contact force by means of using a large actuation voltage as shown by Dickens et al. [col. 6 line 60 to col. 7 line 8].

Claim 20, Dickens et al. discloses a contact switch comprising top [114] and bottom [106] electrode structures, said switch is able to be switched to a collapsed closed state [figure 2] wherein a first electrical contact [120] associated with said top structure is in contact with a second electrical contact [104] associated with said bottom structure, wherein said top structure is in contact with said bottom structure, wherein a predetermined gap is maintained between other portions of said top and bottom structures [by means 118].

Dickens et al. fails to teach the claimed actuation voltage and contact force between the first and second contacts.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the actuation voltage and contact force between the first and second electrical contacts in order to increase the speed of the switch and the contact force by means of using a large actuation voltage as shown by Dickens et al. [col. 6 line 60 to col. 7 line 8].

Claim 18, Dickens et al. discloses the device of claim 20, wherein said top electrode structure comprises a top actuation electrode [60, 61] and one or more stoppers [53, 54].

Claim 19, Dickens et al. discloses the device of claim 20, wherein said bottom electrode structure comprises a bottom actuation electrode [70, 71] and one or more electrically isolated islands [74, 75].

Claims 21, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. [US 2003/0025580], and further in view of Dickens et al. [US 6,657,525].

Claim 21, Wheeler et al. discloses a wireless device comprising a switching arrangement comprising first [1702] and second [1704] contact switches, said first switch able to connect said antenna with a transmitter, and said second switch able to connect said antenna with a receiver [figure 17].

Wheeler et al. fails to discloses claimed switch configuration.

Dickens et al. discloses an Rf Mem switch [abs] comprising: a bottom electrode structure including a bottom actuation electrode [70, 71]; and a top electrode structure including a top actuation electrode [60, 61] and one or more stoppers [54, 55] able to maintain a predetermined gap between said top electrode and said bottom electrode when said collapsible switch is in a collapsed state [figure 3], and a first electrical contact [64] able to be electrically connected with a second electrical contact [42, 43] when said switch is in a closed state, wherein said first electrical contact is positioned at

a desired location on said top electrode [figure 2B, the electrical contact is positioned on the top electrode above the second electrical contact].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the electrostatic Rf Mems switches of Dickens et al. to conserve current since it was known in the art that electrostatic Mem switch use less current for actuation when compared to magnetic Mem switch as the type disclosed by Wheeler et al.

Claim 23, Dickens et al. discloses the switching device of claim 21, wherein said bottom electrode structure comprises one or more electrically isolated islands [74, 75], wherein at least one of said stoppers is able to contact at least one of said islands when said collapsible switch is in said collapsed state [figure 2C].

Claim 24, Dickens et al. discloses the switching device of claim 21, wherein said collapsible switch comprises a support beam [48] associated with said top electrode and having a generally low spring constant.

Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. [US 2003/0025580] in view of DeReus [US 6,876,482].

Claim 21, Wheeler et al. discloses a wireless device comprising a switching arrangement comprising first [1702] and second [1704] contact switches, said first switch able to connect said antenna with a transmitter, and said second switch able to connect said antenna with a receiver [figure 17].

Wheeler et al. fails to disclose claimed switch configuration.

DeReus discloses an Rf Mem switch comprising: a bottom electrode structure including a bottom actuation electrode [106]; and a top electrode structure including a top actuation electrode [114] and one or more stoppers [118] able to maintain a predetermined gap between said top electrode and said bottom electrode when said collapsible switch is in a collapsed state [figure 2], and a first electrical contact [120] able to be electrically connected with a second electrical contact [104] when said switch is in a closed state, wherein said first electrical contact is positioned at a desired location on said top electrode [figure 2, the electrical contact is positioned on the top electrode above the second electrical contact].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the electrostatic Rf Mems switches of Dickens et al. to conserve current since it was known in the art that electrostatic Mem switch use less current for actuation when compared to magnetic Mem switch as the type disclosed by Wheeler et al.

Claim 22, DeReus discloses the device of claim 9, wherein at least one of said stoppers is able to contact said bottom electrode when said switch is in said collapsed state [col. 9 lines 50 to 65].

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Rojas whose telephone number is (571) 272-1998. The examiner can normally be reached on M-F 8-4:00), every other Friday off.

Art Unit: 2832

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Br


ELVIN ENAD
SUPERVISORY PATENT EXAMINER
4/28/06